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Volume II

OCTOBER 19, 1918

No. 1

CO-OPERATIVE PURCHASING CONFERENCE

The first University and College Purchasing Agents Conference, held at the College Camp, Lake Geneva, July 18-20, was a significant forward move toward more effective business methods in educational institutions. About thirty institutions were represented, either by the purchasing agent or another officer and an interesting program was presented.

Dr. Christiansen, of the University of Michigan, read a brief paper on "The Organization and System of the Purchasing Department of a College." Accounting, purchasing and stores were outlined and the entire process of the business office clearly explained. Mr. Holmes, of the University of Illinois, led the discussion on this topic.

"Purchasing by Specification" was the subject of a suggestive paper by Mr. Dinsmore of the University of Chicago, in that it outlined in a very definite way the ground which the University has already covered in this direction. An interesting discussion followed.

Mr. Roundebush, of Miami University, and Dr. Christiansen took up the question of the possibility of standardization of various products and the necessity of accurate estimates from each institution as to quantities in case such co-operation is attempted.

It was unanimously voted to appoint a committee to draft a constitution and submit to the Universities and Colleges in the Conference a plan for a permanent organization, embodying an Exchange Bureau for the purpose of supplying information concerning supplies and materials. The Committee named was,

Dr. E. D. Burton, Baptist Board of Education.

Bishop Nicholson.

Dr. R. L. Kelly, Association of American Colleges.

J. C. Christiansen, University of Michigan.

C. H. Gingrich, Carleton College.

J. C. Dinsmore, University of Chicago.

Particular mention should be made of the continued courtesy of Mr. Hotton, Superintendent of the College Camp, in entertaining the conference.

It was the consensus of opinion that such conferences should be regularly held and the opportunity continued for all to profit through attendance. Ample evidence of the value of this gathering may be noted from the strong address by Mr. Edgar Steiner, Engineer in Charge, The Russell A. Pettengill Company, Industrial Engineers, which we are privileged to present in this issue.

THE PRINTED FORM

By Edgar Steiner

Inasmuch as I am here to talk about the **printed form**, I would like to make it clear why we are devoting our efforts to its study, particularly as it is generally considered of no particular importance. I do not doubt but that you will agree with me, when I say that the **printed form** has not received any consideration, or at least but very little, by either the Purchasing Department or the executives of business.

When you know, however, that in the City of Chicago, there are at least six concerns, under our observation, that are spending approximately one-half million dollars each, annually, for stationery, and there may be many more that we do not know of; when you consider that the railroads of the United States are spending about \$40,000,000; when we add to this what is being spent by the industrial concerns, by the City, State and National Governments, until they total for the whole country, approximately \$400,000,000, spent each year for this item, we begin to appreciate its importance.

But, there is still **another** and even more far reaching reason for the importance of this item. The man in the shop is given a lathe, or a planer, with which to produce a certain product. It is the tool by which he performs his work, and thousands, yes—hundreds of thousands, of men in the offices are given the **printed form** as perhaps their most important tool, and just as the character of the tool given the man in the shop determines the kind of product which he will produce, so the **printed form** will determine the character of the work produced by the man in the office. The **printed form**, however, is even more than a tool. It not only directs the efforts and determines the methods, but also is the record of every transaction. It is not hard to establish the importance of these records and in some concerns, the records represent a big part of the "good will."

Goal Sought and Possible Means:

I understand that the main object of this meeting is to consider establishing a **Central Purchasing Bureau**, and of course, with the purpose of saving money.

I see two ways of doing this:

First—To buy the same thing which you are buying now; for less money, and

Second—To select something different than what you are now using, but which will meet your requirements and which can be manufactured for less money.

I believe that the usual method employed by a **Central Purchasing Bureau**, is to buy the same thing for less money, and they do it by giving the manufacturer an order for a larger quantity at one time, so that his manufacturing costs are reduced. This is an entirely legitimate way, and it is based on good sound principle. It does not require any stretch of imagination, even if it were not backed up by all experience, to know that it would be cheaper to purchase nearly any article for less money in large lots, than it could be purchased in small lots, within, of course, certain limits. By that, I mean, that after having reached a certain quantity in production, a further increase will not materially affect the cost.

The second method of saving money which I mentioned, was to select an article which would meet your required service, but which could be manufactured for less than that particular article which you are now using. This is **Scientific Selection** and having, through **Scientific Selection**, determined a standard which will meet your requirements, conforming the various articles which you are using to the general standard, is **Standardization**. It is our endeavor, through **Standardization**, to make the printed forms sufficiently alike so as to be manufactured by the same process. I do not mean to say by this that all forms in a company are manufactured by the same process, but there are certain standard groups and all forms come under one of these groups.

Existing Conditions and Some of the More Obvious Reasons:

One of the first things that came to attention in looking for a means of proving the value of **Standardization**, was the variance in prices paid by the different branches of the same concern for articles that were used for the same purpose, and in some cases, I might say equally as many, a wide variance in prices paid for identically the same article. To indicate the wide variance in prices that we have found in our investigation of the prices being paid for identically the same form by different branches, I call attention to the results of our investigation made by us for a client purchasing at only four different branches.

The examples given are chosen at random from an investigation covering several hundred forms.

Form No.	Branch No. 1 Annual Use	Branch No. 1 Price	Branch No. 2 Annual Use	Branch No. 2 Price	Branch No. 3 Annual Use	Branch No. 3 Price	Branch No. 4 Annual Use	Branch No. 4 Price	Percent Maximum Diff.
1	6M	\$0.98	20M	\$0.74½	40M	\$0.75	10M	\$1.31	75%
2	25M	1.35	45M	1.10	12M	1.23	26M	1.47	34%
32	20M	9.39			4M	8.57	2M	8.81	60%
37	12M	1.07	8M	3.68	5M	2.90	20M	1.59	244%
38	1M	5.25					1M	1.32	300%

If we had done nothing more than to lay this information before the executives, an immediate and large saving could have been made by having all of the branches supplied from the particular source which the investigation showed to be the cheapest, and in addition thereto, a larger saving by having all of the requirements of all of the branches purchased at one point, because the increased quantity of the order would have brought about a further reduction. I am sure that it will not be necessary to lay further evidence than this before you to indicate the value of a **Central Purchasing Bureau**, sufficient to justify its existence.

There is at least one very evident reason for the existence of a condition of this kind where different prices are being paid for the same article. The Purchasing Department has no way of knowing the requirements of the particular form which it is purchasing. The User probably would know, if he stopped to think about it, that he was going to use 100,000 of a certain form in a year, and also, that if he furnished the Purchasing Department with this information that the 100,000 could be purchased cheaper than 5,000 or 10,000, but some clerk in the particular department using the form, without any more thought than that he will use 10,000 in the next month, requisitions that amount and the Purchasing Department without any further information, buys that amount and in another month's time, another 10,000 is purchased, etc. At some headquarters where they use the same form, they buy 20,000, at some other headquarters—15,000, etc., without any particular reason for determining any one of the particular quantities ordered. The variance in price is obvious, there must be and there is, and then, we find that some of the branches buying larger quantities, pay more than other branches buying only one-half as much. The Purchasing Agent has no way of determining the correctness of the figures, except by competition, and if, in the particular locality in which the forms are bought, the price of printing is high, he pays a high price. The Purchasing Agent, of course, has not the time to make an investigation necessary to determine if he is purchasing at higher or lower prices than some other branch, and probably would not have the authority if he did have the time.

There is also another reason for it—the lack of information on the part of the User upon which to base the design and selection of materials to be used in the manufacture. One man is satisfied with black ink on white paper, of a quality sufficient to meet his requirements. The other man must have black ink, red ink and copying ink and he must have it on blue, green and pink paper, numbered, perforated, punched and with every other possible manufacturing process, before it will satisfy him. In other words, there is no one man who has been given the job of acquainting himself with the actual requirements of the User and at the same time, with the market possibilities and manufacturing processes and the service possibilities of thousands of grades of paper on the market, and without this information, the selection and design is very much "guess work," and the chances are that with a million possible guesses, that he will hardly hit the right one. **Existing conditions** do exist, because there are no useful records which would be such a large help to the Purchasing Department and because there is no **scientific selection**.

Plans for Securing Economies:

From what I have said, it follows quite naturally that if we had records and had **scientific selection**, that economies would immediately result. The records can be started today and preliminary records can be established from a knowledge of what you have purchased in the past. The immediate value of such records would be the purchasing of your printed forms in the largest quantities consistent with the possible reduction in cost. It would mean the **elimination** of rush and emergency orders, and the reduction in the number of requisitions, requests for bids, interviews with printers, receipts of materials, checking of supplies, and invoices and issuing of checks in payment, and it would enable you to buy in such quantities as to always have on hand, a minimum amount of stock at the time that you are ready to make your annual, semi-annual or quarterly purchase, **by contract**.

The **Standardization** of various articles all used for the same purpose, will also bring a quick reward and permanent savings. To illustrate this, one of our clients had seventeen different factories and each factory used a **time clock** card on which the employee registered the time at which he came to work and the time he left in the evening. These tickets were all different, and were being purchased individually by each factory in quantities of about 10,000 at an average price of \$1.38-M. Some of the factories used 2,400 a year, others as high as 36,000, so that one factory bought approximately a 4-year's supply and some other, approximately a 3-months' supply. By standardizing, that is to say, by designing a single ticket which would meet the requirements of all factories, we were able to purchase them in lots of 100,000, at 75c-M or a saving of 63c-M or approximately 45% and by storing them at a Central point, no factory had in stock more than current requirements and they were always available when needed. The same identical method is applicable to say—**examination books**, used in your Colleges and Universities. If all of you use identically the same book, its cost of manufacture is reduced and your individual investment would likewise be reduced.

Another example is letterheads, which we standardized for 33 different individuals and 5 different companies, operating under one head. They were formerly purchased by the individual companies and at different times for the individuals, at an average cost of \$3.40-M. They were **Standardized** and purchased at the same time for \$1.75-M or a saving of 49%. The same thing is undoubtedly applicable to your own **letterheads** and to your own envelopes.

What is true of **examination books**, **letterheads**, **envelopes**, etc., is certainly true of each and every printed form which you use. In the matter of **letterheads**, it is particularly simple, because today, practically everyone uses the same size—8½x11, and it is merely a question of selecting the same paper to be used for all of them, and, of course, they must all be subject to the same manufacturing process, preferably **lithographed**. If you would make a saving through the **Standardization** of your **printed forms**, the same conditions hold true. To come under the same manufacturing specifications, a certain group of forms will have to be printed on the same kind and weight of paper, on the same colored paper, with the same colored ink and at the same time. When

I say at the same time, it means that you are limited by the size of the press and only in this way are we limited by the number of standard forms that can be printed by one and the same press operation. The forms are likewise so arranged as to be printed in varying quantities with respect to the requirements of each individual form, although printed at the same time. We utilize the full bed of the press and the most economical sized press. It is evident to you that none of the forms which are standard and which are to be printed as a standard process, can be on blue paper, when the rest of the forms are all white forms, nor can they be printed in red ink, if the rest of the forms are printed in black ink, nor would it be economical to print one form on two sides, when all the other forms were printed on one side, for it would cost no more to print all forms on two sides, than only one of them. **This is wholesale manufacturing proposition with a wholesale price.** It is the same principle which Ford has applied in the manufacturing of automobiles, and for the same reason that he can sell his Fords at the price that he does, can the forms on a layout of this kind be printed and delivered to you by the printer at about one-half the cost, than when you give him an order today for 5,000 of one and tomorrow for 2,000 of some other form and the next day, 3,000 of still another form, when you could have given him the order for the whole amount at one time and enabled him to print for you at one time.

It has been our experience that it requires the support of the executives, or in your case, perhaps the Trustees of the University or College, to secure the complete acceptance of a standard form. It requires that you be backed up with the authority of the highest man in authority and that he support you in your efforts. It is just as true, however, that after the standard form has been accepted, even though grudgingly, and after it has been given a fair chance in service, that it is even more of a "pet" and more protected than was the old form and it is quite natural that it should, for if it has been properly designed, if the selection has been a **scientific** one, based on evidence of service requirements, so as to make it of most value to the man who uses it, he can not help but like it.

It is also possible, however, to institute large savings through the proper selection of materials that will perform the required service at least as well, and frequently better than the article in use. I have termed this **scientific selection**, inferring thereby that the person who does the selecting, bases his selection on the exact knowledge of the requirements of the form in service and of the determining characteristics of the material which he selects. It is quite usual to find any number of forms which have the same life and which are used for similar purposes and undergoing the same handling, printed on every conceivable kind of color, quality and weight of paper. In other words, the selection of paper was made as a result of a personal like or dislike, rather than because of any particular knowledge of the characteristics of the paper selected, or the fitness of the paper selected to meet the service requirements. If some one with the exact knowledge of which I spoke, will select the paper, kind, grade, weight and color of paper that will meet the requirements of all of these forms in service, the cost of the new paper so selected will invariably be considerably less than the average cost of the paper previously used. An immediate

savings results aside from further savings due to the **centralized purchase** of the one grade or the possibility of manufacturing at one time.

I have in mind a recent example of the possibilities. All the Power Houses of one of our clients are furnished with **log books** and the man in charge of the various apparatus or machines is required to record all facts as they occur day by day in connection with the operation of the machines. They have been using for years, a book which has been made to order and which has only one word printed on each page and that is the name of the month. It is a ruled sheet and printed on ledger stock. It was evident that this book or a similar one which would answer the purpose in every way, as well, as the one in use, could be purchased out of stock from a stationer. We secured a book which met all the requirements at a reduction in cost of 75%.

The usual function of a **Central Purchasing Bureau** is **quantity purchase**, and a reduction in the purchase price logically and ultimately resulting therefrom. If, for instance, the **Central Purchasing Bureau** purchased 500,000 envelopes, instead of each of you individually purchasing a few thousand, it is quite evident that there will be a reduction in the cost of the envelopes. You could furnish innumerable examples yourself, of the possibilities of quantity purchase as a factor in reducing the cost of what you are using now. But, there is another method of purchasing which will at least double the savings that usually result from a **Central Purchasing Bureau** and we have termed it **specialized purchase**. It bears a close resemblance to **scientific selection**, because it involves an exact knowledge of the user's requirements and of the manufacturing possibilities.

It is necessary in **specialized purchase** that there be a direct contact between the User, the Executive, the Storekeeper and the Files and if you have such a man in your organization, the Systematizer. The Systematizer, as the man interested in introducing correct methods, can give the Purchasing agent, information relative to the requirements of the user, and the User, himself, can furnish this same information. That is to say, the Purchasing Agent, or whoever is going to determine in an organization, the design of the form and the character of the paper used and whether it is going to be printed on one side or two sides, or any one of the innumerable other details of the specifications, must be **fully conversant with the needs of the form in service**. He must know whether it is going to have a life of twenty-four hours, or whether it is going to be filed away and continually referred to for a period extending over possibly five or ten years. Certainly the same paper should not be selected in both cases. He must keep in touch with the Storekeeper, who will furnish him with a record of the purchases in the past, so that he may determine the proper supply to purchase to secure the best price and he must keep in touch with the Files, so that he may know the determining characteristics of the various papers used. The forms that have been filed away, tell the story better than any other means of which I know, for it shows the condition of the form after it has been used. And above all, keep in touch with the **executive** in this work, so that he will **back you up with the proper authority in securing a standard form**. If you will gather this information and furnish it to your **Central Purchasing Bureau**, they will be in the best possible position to buy economically.

As to keeping in touch with the manufacturing conditions, I take it that it would be more serviceable to have this function performed by the **Central Purchasing Bureau**, rather than to have each of you individually attempt to do it. It is necessary that you do what the printer should do—study the manufacturing processes and know what it costs for each of them. Keep in touch with the **typesetter**, so that you will get a form designed so it will best meet your requirements; study the work of the **electrotyper** and be able to determine whether the plates which he delivers to you, are the kind that are most economical to buy, and that they have been manufactured so that you will be able to use them, the longest time possible. It is likewise important to keep in touch with the labor conditions affecting the manufacture. If a printer comes to you and tells you that his labor costs have gone up 20% and it is therefore necessary for him to charge you 15% more for your forms than he did last time, you should be in a position to determine whether that statement is correct. You should know whether labor is so large a proportion of your printing cost. You should keep in touch with the Paper Market; and be able to determine whether samples of paper submitted to you will fulfill the particular service which is going to be required. We have done both of these. We have plotted the prices of all raw materials entering into the manufacture of all of the various kinds and grades of paper. It is a well known fact that the cost of the raw materials advances or diminishes a certain period of time before the cost of the finished product is likewise affected and by knowing the fluctuations in the raw material market, it is not difficult to determine the proper time to buy paper. We have likewise established a **laboratory**, for testing paper, for research, so as to determine what ingredients are in the paper and the proportion of the various ingredients which will bring about a finished product, necessary to meet the varying service requirements. And in connection with the **purchase** of paper, we conform each sample to a rigid series of tests, physically, chemically, and microscopically. We know the percentage of rag, percentage of sulphite, percentage of linen rag, as against cotton rag, etc. One particular test will be of interest. It is known as the **folding endurance** and measures the number of times a piece of paper can be folded on the same line, before it will break. It is the same sort of service that is given to a sheet of paper which is constantly being fingered to turn it over. Nothing, however, has received more of our consideration, than the **study of manufacturing costs**. We have analyzed the cost of practically every operation in the manufacture of the **printed form**, so as to determine the effect on the final cost of doing this, that, or the other thing in the **design** of a standard form. It likewise, has given us the necessary information for determining the size to be used and the number of forms to be manufactured. It will likewise advise you whether it will be cheaper to print a certain kind of a form in connection with others, or whether it will be cheaper to **lithograph** it, or whether a slight variation in the design will seriously affect the cost of all of the other forms being manufactured in connection with it, and I might go on to recount almost endlessly, the value and effect of the proper and definite knowledge of **manufacturing costs**. Now, all of these things together, we have termed **specialized purchase**, and it means that we have **specialized**, to the same extent that the surgeon specialized, or that the lawyer specialized or that any other profession is capable of

specialization, along certain definite lines and within certain definite limits.

The information resulting from this study and from the collection of this information finds its expression in the **purchase specifications**. Our idea of a specification is that it must exactly define the thing to be purchased, so that there can be no misinterpretation on the part of the manufacturer and so there can be no disappointment on the part of the User. On the other hand, that the printer will find the specification so written, that it will be easy for him to figure the job and because it is specific in its definition of requirements, that it will not be necessary for him to add a certain percentage to take care of any possible errors in his estimate. Likewise, the specifications should be so prepared as to take advantage in every possible way of your knowledge of the manufacturing processes, so that it will be least costly to manufacture the desired article. The purchase of **printing by specifications** is not usual to say the least, and in many cases where it has been attempted, it has not been entirely successful, because, undoubtedly, there was no determination to so write the specification as to make it attractive to the printer, and to make it easy to understand, or to assemble it in any logical order. The specification which I have here, is one that has come to our attention recently and covers the purchase of 20,000,000 **printed forms**. The printer who got the job told us that it took four men, six weeks to figure it and that when he got through, he added 25% to take care of possible errors in making up his estimate and in spite of that, got the job. This other specification is one which we recently prepared for one of our clients, and covers the purchase of 16,000,000 forms. The printer who got the job told us that it took him about one-half hour to go over it with his estimator to determine the proper basis for figuring it, and then it took the estimator about two hours to make up his bid.

Results:

Summing up the results of this work, first as affecting the organization of the Purchasing Department itself, it means that there are no rush orders, you do not have to lay aside what you are doing and order 5,000 forms for John Smith. It means that there are less orders, that there are less requisitions, less interviews, less purchase orders, less receipts, less checking of receipts and invoices and less financial transactions that accompany every purchase. It means that all of the forms are purchased at certain definite periods throughout the year and that one order covers all of them. I speak of this as being the **ideal condition**, but it is undoubtedly true that the condition from the very start, will be much better than your usual existing conditions today. In our work, for one of our clients, we reduced the number of orders in the first year by 1,600 and this is well worth stating, as they, themselves, determined the cost of each order to be about 60 cents.

But what is still more important, is that it is a **move in the right direction**. It is a movement for conservation, for saving, that will logically result in installing standard practices, standard routines, etc., which was the thing that we originally had in mind and which we still believe has even a greater value than the dollars and cents savings

through the purchase of the materials used. The installation of **Standard Practices** means, that the one best way of doing the work in hand is determined and **everybody does it that way.**

Standard practices result directly from standard forms and the savings are worth while. We standardized a certain form for one of our clients resulting in a reduction in cost from \$1.25-M to 75c-M. Any other form printed on the same paper stock and capable of the same manufacturing process could therefore also be purchased for 75c-M. This client also had another series of forms, a cheap card stock on which was printed one letter or figure and by varying combinations of these cards, a different arrangement of letters and numbers resulted, as A 328, B 462, X 75, etc. These different combinations were used as a marker to designate certain space and were changed about every day. There was no definite or positive method for applying these markers, except that all cards were punched with two holes on each edge, so that a fastener could be used to attach the various cards to each other in arranging the different combinations. These letters and numbers were printed on a cheap paper stock of very limited life and lasted for hardly more than one change, so that they were being used at the rate of about 1,000,000 per year and were costing \$1.80-M or \$1,800.00 annually. The first change we made was to standardize them, so that they could be printed with the form I spoke of above for 75c-M and on a much better and serviceable paper stock. We then designed a **holder**, so as to provide a positive and standard method for applying these markers and the lessened wear and tear, as compared with fastening the cards together, and the better paper stock, greatly increased the life of these forms so as to reduce the consumption to 200,000 per year. But anticipating this, we printed four numbers or letters on each card and arranged the holder so that only one would show and therefore again, reduced the consumption to one-fourth of 200,000 or 50,000, and at a cost of 75c-M or \$37.50 per year, compared with a former cost of \$1,800.00, at a saving of 98%. The markers had now become so inexpensive that for greater convenience, two were used to mark the same space, as had been formerly designated by only one, so that the consumption was increased to 100,000 per year, at a cost of \$75.00 or a total net saving of 96%.

I have no definite way of knowing the annual expenditure for stationery for all the colleges and universities represented in this Association, but from such figures as I have been able to get, I have estimated it at several hundred thousand dollars a year. Nor can I estimate your possible savings, except by a comparison with the results we have obtained. Our methods have, of course, been constantly bettered since our beginning, but for the client for which we last completed the installation of our methods, the annual requirements were purchased for \$12,000.00 and they had formerly cost \$30,000.00, so that there is an annual savings of \$18,000.00 or 60%. I do not know that we can continue at this pace, but if the same savings which we have secured in our work for other companies is used as a basis for determining the value of this work to you, I have no hesitancy in saying that your savings will amount to at least \$100,000 annually, which is equivalent to an endowment of \$2,000,000 invested to yield 5%, and I take it that this sum is sufficiently

large to warrant your consideration of putting in practice, a method that will bring it about.

As I have already stated, but I think it worth repeating, this work is of no value unless the savings which are made, are savings to the manufacturer or supplier, through the conservation of labor and material. The results can not be permanent; they can not be lasting, unless they are the result of a saving not only to the buyer, but also to the seller. If this is true, and that it is I think we have conclusively shown to our clients the possibility of savings in the **purchase of stationery** throughout our country is enormous. Of the approximately \$400,000,000 spent annually for this item, there is no question about the possibility of saving at least \$100,000,000, which is sufficient to pay the interest on the First Liberty Loan of three billion dollars, and this interest could be paid indefinitely, because the **savings are permanent**.

An exceptional opportunity to present the cause of Christian education is being utilized by Dr. Kelly, of the Council headquarters, this month. During the week of August 18-25 he is to make an amphitheater address at Chautauqua, N. Y., and to participate in a series of conferences. His subject will be "The New Education Task of the Churches."